

PATENT APPLICATION

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TITLE OF THE INVENTION

Integrated Console and Controller

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to an integrated console and controller, such as for example might be used with a gaming system using a television as a display unit.

2. Related Art

Some computing devices are designed to be used with a television as their display unit, with the effect that the computing device can be sold separately from its display and therefore relatively inexpensively. Known systems include consoles for arcade-like games, which have the capability of presenting an audio and video output to the television, and receiving inputs from a hand-held controller.

One difficulty with known systems is that they can be bulky or unwieldy when coupled to the television, with the effect that they can be relatively difficult to move around, such as for example to another television at another location. The "TV Games" video game system, described at www.jakkstvgames.com, appears to include a system in which a controller is included within the game console, with the effect that the game console can be coupled directly to the television. While this system appears to achieve the goal of making the system less bulky, it is subject to several drawbacks. The

1 system appears directed to a specific emulator included within a game console that
2 looks like a legacy television game. This has the effect that it does not provide for alter-
3 native games playable using the game console or for upgrades to the games playable
4 using the game console. This also has the effect that it does not provide for multiplayer
5 interaction or for interaction between a local player and a remote device.

6
7 Accordingly, it would be advantageous to provide a method and system
8 not subject to drawbacks of known systems.

9 10 SUMMARY OF THE INVENTION 11

12 The invention provides a method and system capable of combining the
13 capabilities of a console and controller, having a hand-held form factor that includes a
14 cartridge that can be inserted or removed (and possibly including a rewritable storage
15 element such as a "flash" memory), and using a computing device capable of general
16 purpose processing, such as for example a secure processor such as described in earlier
17 patent applications, as described herein as the "incorporated disclosure." Providing the
18 removable storage element has the effect that software can be upgraded or replaced, in-
19 cluding the possibility of that software being dynamically upgraded or replaced. In
20 embodiments where the storage element is rewritable, that software might be dynami-
21 cally upgraded or replaced without involving a second cartridge. The computing de-
22 vice also includes additional communication links to supplemental consoles, with the

1 effect that the method and system can support multiplayer games and games with
2 multiple consoles. In one embodiment, the communication link can be coupled to a PC
3 workstation or to a network router, with the effect that the method and system can
4 support interactive communication with the effects that (1) dynamic upgrades can be
5 performed substantially in real time, (2) multiplayer games can include players in sub-
6 stantially remote locations, and (3) games can include contests among multiple players
7 for "high score" and the like, and can also include associations of players, such as for
8 example player teams.

9
10 After reading this application, those skilled in the art would recognize that
11 the techniques described herein provide an enabling technology, with the effect that
12 heretofore advantageous features can be provided that heretofore were substantially in-
13 feasible.

14 15 BRIEF DESCRIPTION OF THE FIGURES

16
17 Figure 1 shows a block diagram of a system including a television and an
18 integrated console/controller with a removable storage element, optionally including
19 one or more supplemental consoles, optionally including a workstation, and optionally
20 including one or more remote players.

Figure 2 shows a block diagram of an example integrated console/controller.

Figures 3A -- 3AJ (collectively referred to herein as figure 3) show a design of an example integrated console/controller.

INCORPORATED DISCLOSURES

This application claims priority of the following documents, each of which is hereby incorporated by reference as if fully set forth herein.

- U.S. patent application 10/360,827, filed February 7, 2003, attorney docket number 196.1006.01, titled "Secure and Backward-Compatible Processor and Secure Software Execution Thereon," and all applications claiming priority thereof.

These documents are hereby incorporated by reference as if fully set forth herein, and are sometimes referred to herein as the "incorporated disclosure".

Inventions described herein can be used in combination or conjunction with technology described in the incorporated disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

1
2 Preferred embodiments of the invention are described herein, including
3 preferred device coupling, device functionality, and process steps. After reading this
4 application, those skilled in the art would realize that embodiments of the invention
5 might be implemented using a variety of other techniques not specifically described
6 herein, without undue experimentation or further invention, and that such other tech-
7 niques would be within the scope and spirit of the invention.

8
9 *Lexicography*

10
11 The following terms refer or relate to aspects of the invention or its em-
12 bodiments. The general meaning of each of these terms is intended to be illustrative
13 and in no way limiting.

- 14
- 15 • The term “console” generally describes any device capable of delivering control
16 inputs, either directly or indirectly, from a user to a controller of a game system
17 or similar system. As described below, a console might include an integrated
18 console/controller, which can perform both the functions of a console and of a
19 controller, or might include a secondary console, which can perform the func-
20 tions of a console. The concept of a console is broad, and includes any manner of
21 user input device, possibility including a keyboard or keypad, joystick or mouse
22 or other pointing device, or other control buttons, whether pre-selected or dy-

namically presented using a flat-panel controller, and the like. The console might include a direct wire connection, a direct RF or IR connection, or an indirect (switched) connection.

- The term “controller” generally describes any device capable of receiving control inputs, either directly or indirectly, from a user of a console of a game system or similar system, and capable of providing a set of outputs that can be coupled to a display element, such as for example a television. As described below, a controller might include an integrated console/controller, which can perform both the functions of a console and of a controller. The concept of a controller is broad, and includes any manner of computing device, possibility including a general purpose computing device (or operating in combination or conjunction with a general purpose computing device), such as for example a PC workstation.

- The term “rewritable storage element” generally describes any device capable of maintaining information for use by an integrated console/controller, and capable of being removed, replaced, or rewritten with new information. As described below, a rewritable storage element might include a flash memory. The concept of a rewritable storage element is broad, and includes any manner of storage device capable of being read and written, whether random access or not, and whether the read or write operations are relatively rapid or not. For some exam-

ples, not intended to be limiting in any way, the rewritable storage element might include an SRAM, flash memory, bubble memory, or disk drive (magnetic or optical or both). In one embodiment, the size of the rewritable storage element is about 1 inch by 2 inches, but there is no specific requirement for that particular size. Moreover, it is also possible for the rewritable storage element to include a relatively small transceiver of about 1 inch by 2 inches with which it exchanges information with the integrated console/controller, while the main body of the rewritable storage element is maintained elsewhere and has a different size.

- The phrase “secure processor” generally describes any device that can use information from a rewritable storage element, and can operate as a relatively secure computing device performing the functions of a controller for a game system or similar system. As described below, the secure processor is relatively secure against tampering, with the effect that other elements of the system are capable of communicating privately and securely with the secure processor. The concept of a secure processor is broad, and includes any general purpose or special purpose computing device for which there is at least some secure memory, secured against inspection or intrusion from outside the secure processor, and for which there is at least some executive control capable of preventing application software from disclosing the contents of that secure memory. In one em-

1 bodiment, the secure processor has at least some built-in security software that
2 cannot readily be circumvented.

- 3
- 4 • The terms “replace,” “update,” and “upgrade,” generally describe any method
5 that can alter, amend, change, erase, or otherwise modify information received
6 from the rewritable storage element. The concept of replacing, updating, or up-
7 grading information on the rewritable storage element is broad, and includes
8 both (a) electronic replacement of information stored on the rewritable storage
9 element, and (b) physical replacement of the rewritable storage element with an-
10 other rewritable storage element having distinct information stored thereon. The
11 terms “dynamic” and “dynamically,” when used in reference to concept of re-
12 placing, updating, or upgrading information, generally describe any method by
13 which those steps of concept of replacing, updating, or upgrading information
14 are performed relatively quickly relative to operation of the game system or
15 similar system.

- 16
- 17 • The phrase “supplemental console” generally describes any device that can op-
18 erate as a console, but which is supplemental to the integrated con-
19 sole/controller. The concept of a supplemental console is broad, and includes
20 both (a) devices only able to act in combination or conjunction with the inte-
21 grated console/controller, and (b) device that are able to act independently of the
22 integrated console/controller, but subordinate themselves to control by the inte-

1 grated console/controller in the presence of the latter. For one example, not in-
2 tended to be limiting in any way, a second integrated console/controller which
3 defers to the first integrated console/controller can perform the function of a
4 supplemental console.

- 6 • The phrases “multiplayer games” and “games with multiple consoles” generally
7 describe any game system or similar system in which more than one player or
8 more than one console is involved. In one embodiment, multiple players act
9 concurrently at separate consoles, but there is no particular requirement there-
10 fore. Moreover, a game system or similar system in which a single player oper-
11 ates more than one such console is considered a multiplayer game or a game
12 with multiple consoles in this application.

13
14 The scope and spirit of the invention is not limited to any of these defini-
15 tions, or to specific examples mentioned therein, but is intended to include the most
16 general concepts embodied by these and other terms.

18 *System Elements*

19
20 Figure 1 shows a block diagram of a system including a television and an
21 integrated console/controller with a removable storage element.

1 A system 100 includes an integrated console/controller 110, capable of
2 being coupled to a television or other display device 120 and to an optional power
3 source 130.

4
5 *Integrated Console/Controller*
6

7 The integrated console/controller 110 includes a handheld controller
8 housing 111, a set of player inputs 112, an audio/video output 113, a set of control cir-
9 cuits 114, and a removable storage element 115.

10
11 The handheld controller housing 111 and player inputs 112 are further de-
12 scribed herein with reference to figure 3.

13
14 The audio/video output 113 is coupled between the integrated con-
15 sole/controller 110 and the display device 120.

16
17 In one embodiment, the audio/video output 113 is also coupled to the
18 optional power source 130, and includes a power coupling, such as for example an AC
19 adapter usable with an AC power source such as a home power outlet. However, there
20 is no particular requirement that the audio/video output 113 involves a power cou-
21 pling. In alternative embodiments, power might be supplied to the integrated con-
22 sole/controller 110 by battery storage or another power source.

1
2 In one embodiment, the audio/video output 113 can communicate a set of
3 audio signals and a set of video signals from the integrated console/controller 110 to
4 the display device 120. However, there is no particular requirement that audio/video
5 output 113 involves any audio signals. In alternative embodiments, audio outputs
6 might be provided directly by the integrated console/controller 110 using a speaker or
7 another audio output device.

8
9 The control circuits 114 are further described herein with reference to fig-
10 ure 2.

11
12 In one embodiment, the removable storage element 115 includes at least
13 some rewritable memory, such as for example NAND flash memory. With at least
14 some rewritable memory, the removable storage element 115 can be dynamically up-
15 dated by writing new information, such as for example when making a request for up-
16 date from a server device (further described below) and receiving updated information
17 from that server device. However, there is no particular requirement that the remov-
18 able storage element 115 involves a rewritable memory. In some embodiments, the re-
19 movable storage element 115 might be updated, dynamically or otherwise, by physi-
20 cally replacing the removable storage element 115 with a different removable storage
21 element 115 including different information.

Supplemental Consoles

Figure 1 also shows the system optionally including one or more supplemental consoles.

The system 100 optionally includes one or more supplemental consoles 140. Each supplemental console 140 includes a handheld controller housing 141, and a set of player inputs 142, similar to the integrated console/controller 110. However, there is no particular requirement that any supplemental console 140 be identical or even similar in design or user interface to the integrated console/controller 110. In alternative embodiments, each supplemental console 140 might be substantially distinct, such as for example by being adapted to a selected game or to a selected player role in a multiplayer game.

A first supplemental console 140 can be optionally coupled to the integrated console/controller 110 using a substantially passive coupler 143 interposed between the integrated console/controller 110, the television 120, and the first supplemental console 140. This has the effect that the first supplemental console 140 is capable of exchanging control signals between its player inputs 142 and the integrated console/controller 110, similar to a case where the supplemental console 140 was coupled to a controller without an integrated console.

1 In one embodiment, the passive coupler 143 includes a television signal
2 splitter. However, there is no particular requirement for the passive coupler 143 to in-
3 clude an analog signal splitter. In alternative embodiments, the substantially passive
4 coupler 143 might include a digital signal router or a portion of a digital signal routing
5 framework.

6
7 A second supplemental console 140 can be optionally coupled to the inte-
8 grated console/controller 110 using a direct link 144 between the integrated con-
9 sole/controller 110 and the second supplemental console 140. This has the effect that
10 the second supplemental console 140 is capable of exchanging control signals between
11 its player inputs 142 and the integrated console/controller 110, similar to a case where
12 the supplemental console 140 was coupled to a controller without an integrated console.

13
14 In one embodiment, the direct link 144 includes an electrical cable, an IR
15 (infrared) link, or an RF (radio frequency) link. However, there is no particular re-
16 quirement for the direct link 144 to be physically direct without any interposed devices.
17 In alternative embodiments, the direct link 144 might include a digital signal router or a
18 portion of a digital signal routing framework.

19
20 After reading this application, those skilled in the art would recognize that
21 providing either the first supplemental console 140 or the second supplemental console
22 140, and coupling at least one of them to the integrated console/controller 110, has the

1 effect that the system 100 can support a multiplayer game, or another game having
2 multiple consoles.

3
4 *Interaction with Workstation*

5
6 Figure 1 also shows the system 100 optionally including one or more in-
7 teractive workstations.

8
9 The system 100 optionally includes one or more interactive workstations
10 150. In one embodiment, each such workstation 150 includes a general purpose com-
11 puting device, program and data memory, mass storage, and a communication link 160
12 with a remote device 170, such as for example a PC desktop or laptop computer with an
13 Internet connection. However, there is no particular requirement that any workstation
14 150 include a general purpose computing device. In alternative embodiments, one or
15 more workstations 150 might include substantially special purpose computing devices,
16 such as for example a computing device optimized as a graphical display element in a
17 selected game, or a computing device optimized as a server for a selected game.

18
19 For example, not intended to be limiting in any way, in alternative embodiments, the
20 integrated console/controller 110 may be coupled directly to a network adapter 151,
21 which is itself coupled to the communication link 160. The network adapter 151 might
22 include a network router, broadband modem, such as for example a DSL modem or a

1 cable modem, or a PSTN (public switched telephone network) modem, such as for ex-
2 ample a V.90 modem. As described below, in one embodiment the integrated con-
3 sole/controller 110 includes a USB port or a similar communication link with the work-
4 station 150. In alternative embodiments, that USB port or similar communication may
5 be coupled in addition or instead to the network adapter 151.

6
7 In one embodiment, the integrated console/controller 110 includes a USB
8 (universal serial bus) port or a similar communication link with the workstation 150,
9 with the effect that the integrated console/controller 110 can exchange information with
10 the workstation 150. As described above, the workstation 150 might provide supple-
11 mental computing for the game, or as described below, the workstation 150 might pro-
12 vide an indirect connection, using the communication link 160, to the remote device 170
13 capable of supplemental computing for the game.

14 15 *Remote Interaction*

16
17 Figure 1 also shows the system 100 optionally including one or more re-
18 mote players.

19
20 The system 100 optionally includes one or more remote players 171 dis-
21 posed at one or more remote devices 170, such as for example if the one or more remote

1 devices 170 themselves include integrated console/controllers 110 or supplemental con-
2 soles 140 disposed at substantially remote locations.

3
4 In a first embodiment, the remote players 171 can use the remote devices
5 170 to exchange information with the integrated console/controller 110, such as for ex-
6 ample using the communication link 160 and the one or more interactive workstations
7 150.

8
9 In a second embodiment, the remote players 171 can use the remote de-
10 vices 170 to exchange information with a game server 172, which itself exchanges in-
11 formation with the integrated console/controller 110, such as for example using the
12 communication link 160 and the one or more interactive workstations 150.

13
14 After reading this application, those skilled in the art would recognize that
15 providing a connection between the remote players 171 and the integrated con-
16 sole/controller 110, either more directly using the workstation 150 or less directly using
17 the remote server 172, has the effect that the system 100 can support a game including
18 remote players, or another game having remote consoles.

19
20 After reading this application, those skilled in the art would recognize that
21 providing a connection between the remote players 171 and the integrated con-
22 sole/controller 110, either more directly using the workstation 150 or less directly using

1 the remote server 172, has the effect that the system 100 can also support a game con-
2 test, such as for example where each player plays individually, and can be responsive to
3 aggregates or statistical measures of a group of players, such as for example a high
4 score, a median score, or an aggregate score for a team of players.

5
6 *Integrated Console/Controller (Circuits)*
7

8 Figure 2 shows a block diagram of an example integrated con-
9 sole/controller.
10

11 A set of control circuits 114 is disposed in the housing 111, and includes a
12 storage interface 210 capable of being coupled to the removable storage element 115, a
13 controller input interface 220 capable of being coupled to the player inputs 112, an
14 audio/video interface 230 capable of being coupled to the display device 120, an op-
15 tional power interface 240 capable of being coupled to the optional power supply 130,
16 an optional controller interface 250 capable of being coupled to one or more supple-
17 mental controllers 140, an optional workstation interface 260 capable of being coupled
18 to one or more workstations 150, a memory 270 and its associated memory interface,
19 and a computing device 280 capable of executing or interpreting instructions from the
20 memory 270 to control the integrated console/controller 110.
21

1 The storage interface 210 might include a known interface for operating in
2 combination or conjunction with a NAND flash cartridge or another type of removable
3 storage element 115.

4
5 Similarly, the controller input interface 220 might include a known inter-
6 face for operating in combination or conjunction with the player inputs 112.

7
8 Similarly, the audio/video interface 230 might include a known interface
9 for operating in combination or conjunction with the display device 120, such as for ex-
10 ample a direct audio or video output interface. As described above, the integrated con-
11 sole/controller 110 may alternatively or in addition include a speaker or other audio
12 output, so there is no particular requirement for actual audio output to the display de-
13 vice 120.

14
15 Similarly, the optional power interface 240 might include a known inter-
16 face for operating in combination or conjunction with the optional power supply 130.
17 As described above, the integrated console/controller 110 may alternatively or in addi-
18 tion include a battery or other self-powering element, so there is no particular require-
19 ment for an actual power interface 240.

20
21 Similarly, the optional controller interface 250 might include a known in-
22 terface for operating in combination or conjunction with one or more supplemental

1 controllers 140. In one embodiment, the controller interface 250 includes one or more
2 relatively low-speed bidirectional serial ports.

3
4 Similarly, the optional workstation interface 260 might include a known
5 interface for operating in combination or conjunction with one or more workstations
6 150. In one embodiment, the workstation interface 260 includes a set of dual mode USB
7 ports, capable of being controlled by the workstation 150 as a communication link. In
8 alternative embodiments, the workstation interface 260 may include a extendible bus,
9 such as a mezzanine bus such as a PCI bus extension.

10
11 Similarly, the optional workstation interface 260 might include a known
12 interface for operating in combination or conjunction with one or more workstations
13 150. In one embodiment, the workstation interface 260 includes a set of dual mode USB
14 ports, capable of being controlled by the workstation 150 as a communication link. In
15 alternative embodiments, the workstation interface 260 may include a extendible bus,
16 such as a mezzanine bus such as a PCI bus extension.

17
18 The memory 270, its associated memory interface, and the computing de-
19 vice 280 operate in combination or conjunction, with the effect that the computing de-
20 vice 280 executes or interprets instructions from the memory 270 to control the inte-
21 grated console/controller 110 as described herein.

1 *Integrated Console/Controller (Design)*

2
3 Figures 3A – 3AJ (collectively referred to herein as figure 3) show a design
4 of an example integrated console/controller.
5

6 *Alternative Embodiments*

7
8 Although preferred embodiments are disclosed herein, many variations
9 are possible which remain within the concept, scope, and spirit of the invention. These
10 variations would become clear to those skilled in the art after perusal of this applica-
11 tion.
12

13 After reading this application, those skilled in the art would recognize that
14 the techniques described herein provide an enabling technology, with the effect that
15 heretofore advantageous features can be provided that heretofore were substantially in-
16 feasible.
17

18 After reading this application, those skilled in the art will recognize that
19 these alternative embodiments and variations are illustrative and are intended to be in
20 no way limiting.